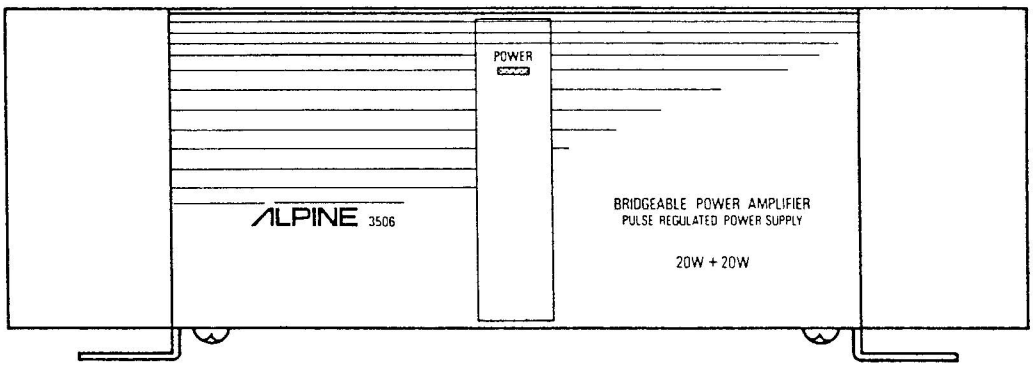
ALPINE SERVICE MANUAL

Bridgeable Power Amplifier With Pulse Regulated Power Supply 20W+20W



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Specifications

Power Output	20 Watts per channel at 1,000 Hz with 0.1% THD
BTL Power Output	40 Watts at 1,000 kHz with 0.5% THD
Frequency Response	10 Hz to 50 kHz ±3 dB
Signal to Noise Ratio	90 dB (IHF A WEIGHTED)
Input Sensitivity/Impedance	500mV ±1 dB/10 ±2K ohms
Speaker Impedance	4 ohms
Channel Separation	60 dB
Damping Factor	40
Power Requirement	14.4V DC (11 to 16V allowable)
Fuse Requirement	15A (Battery Lead) 5A (Speaker) 3A (Ignition Lead)
Semiconductors	36 Transistors, 13 Diodes, 3 Zener Diodes
Dimensions (W x H x D)	6-1/4" x 2" x 7-7/8" 160mm x 50mm x 20mm
Weight	3 lb 2 oz. 1.6 Kg

Notes: (1) Power output is measured per Ad Hoc recommended standards for car audio amplifiers.
(2) Due to continuing product improvement, specifications and design are subject to change without notice.

Parts Locations and Disassembly Instructions

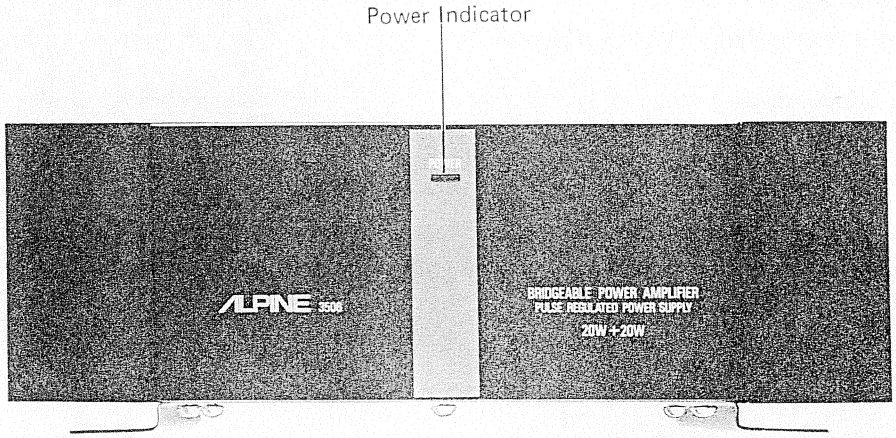


Figure 1

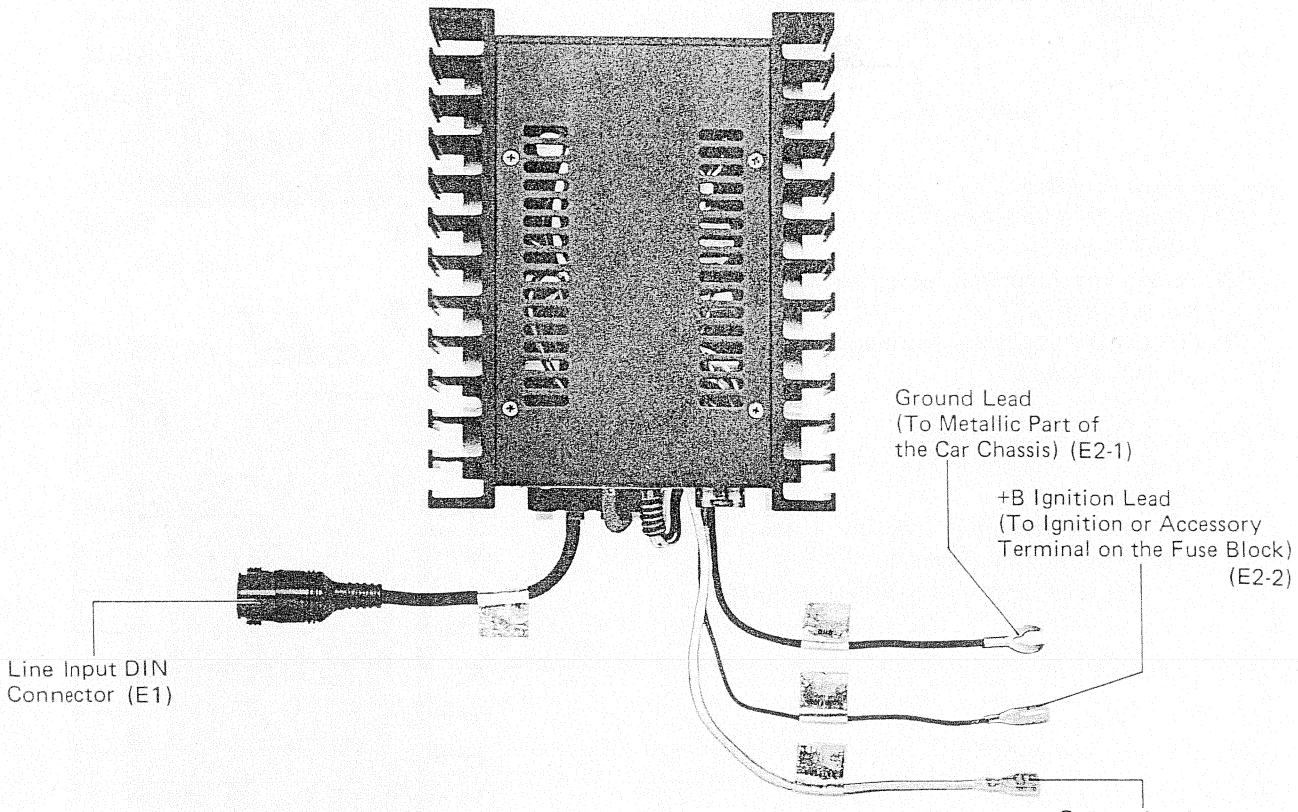


Figure 2

1. Removal of Top Cover
   (1) Remove four screws marked " ● " as shown in Figure 3.
   (2) Lift the rear side of the top cover upward and pull it backward.

2. Removal of Bottom Cover
   (1) Remove five screws marked " ○ " as shown in Figure 4.
   (2) Remove the bottom cover.

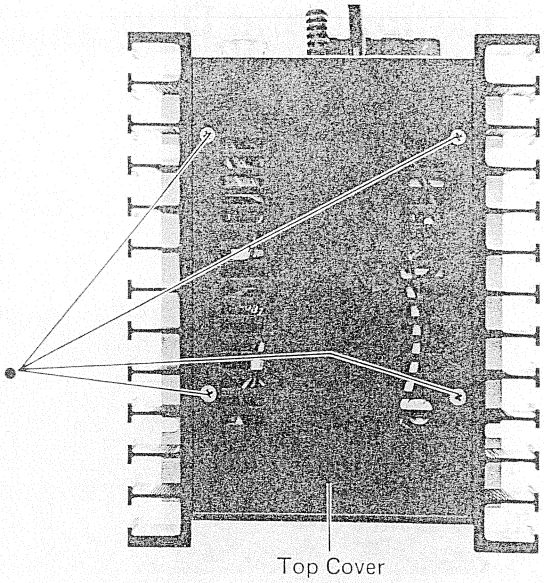


Figure 3

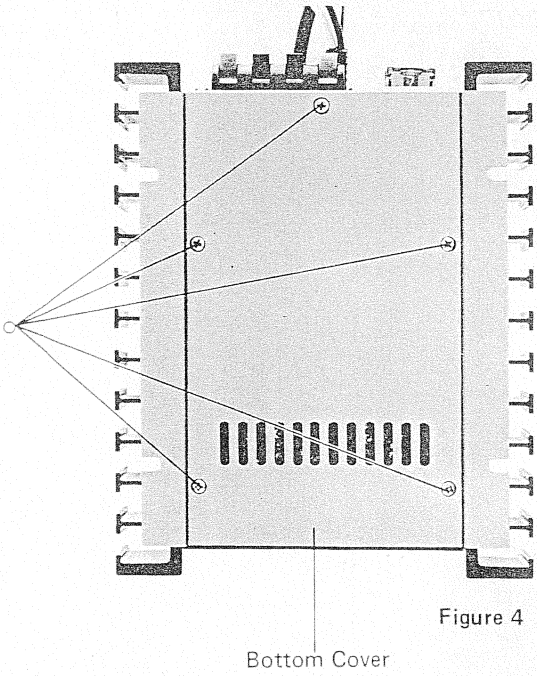


Figure 4

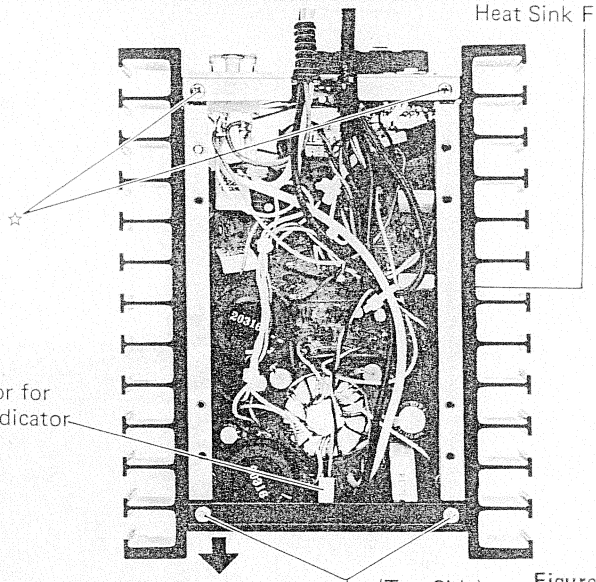


Figure 5

3. Removal of Front Panel
   (1) Remove four screws marked " ★ " as shown in Figures 5 and 6.
   (2) Detach the connector for power indicator as shown in Figure 5.
   (3) Pull out the front panel in the arrow direction as shown in Figure 5.

4. Removal of Rear Panel Assembly
   (1) Remove seven screws marked " ☆ " as shown in Figures 5, 6 and 7.
   (2) Pull out the rear panel assembly in the arrow direction as shown in Figure 6.
   In this case, be careful not to damage lead wires.

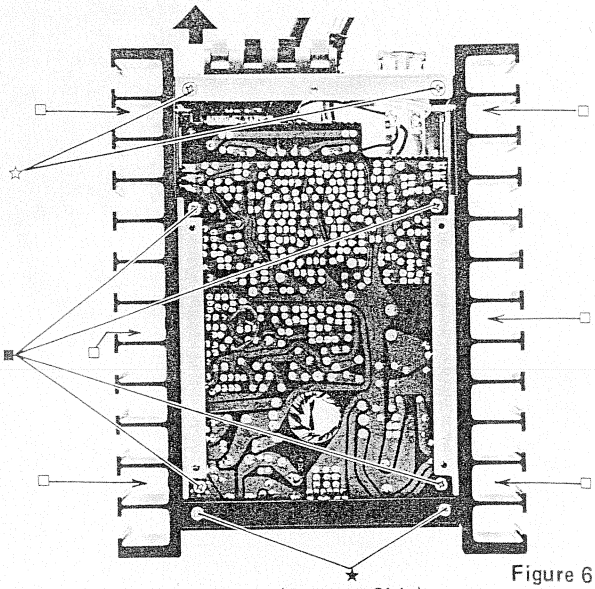


Figure 6

5. Removal of Main P.C. Board Assembly

(1) Remove four screws marked " ■ " as shown in Figure 6.

(2) Remove six screws marked " □ " as shown in Figure 6. These screws are indicated with symbol No. 1 in the exploded view on page 17 and 18.

(3) The main P.C. Board assembly and heat sink fins can be separated.
In this case, be careful not to damage lead wire and not to lose parts.

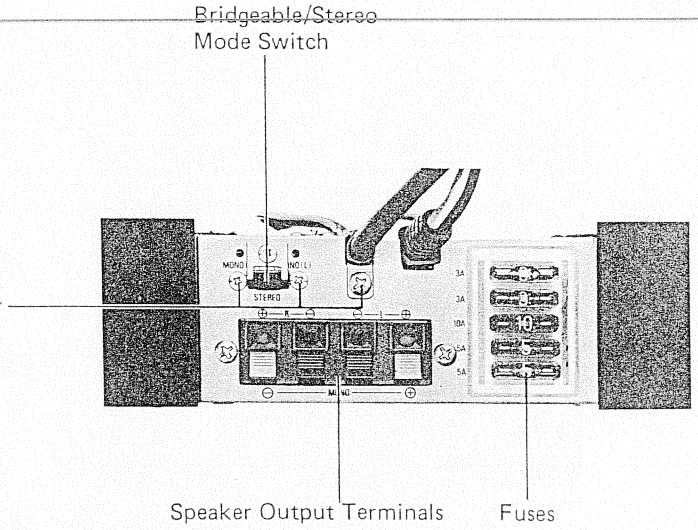
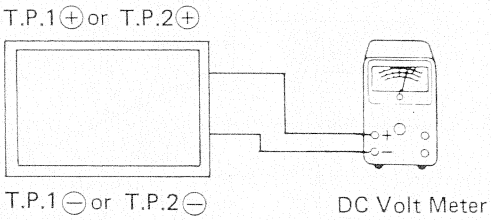


Figure 7

Adjustment Procedures

- Idle Current Adjustment

(1) Connections



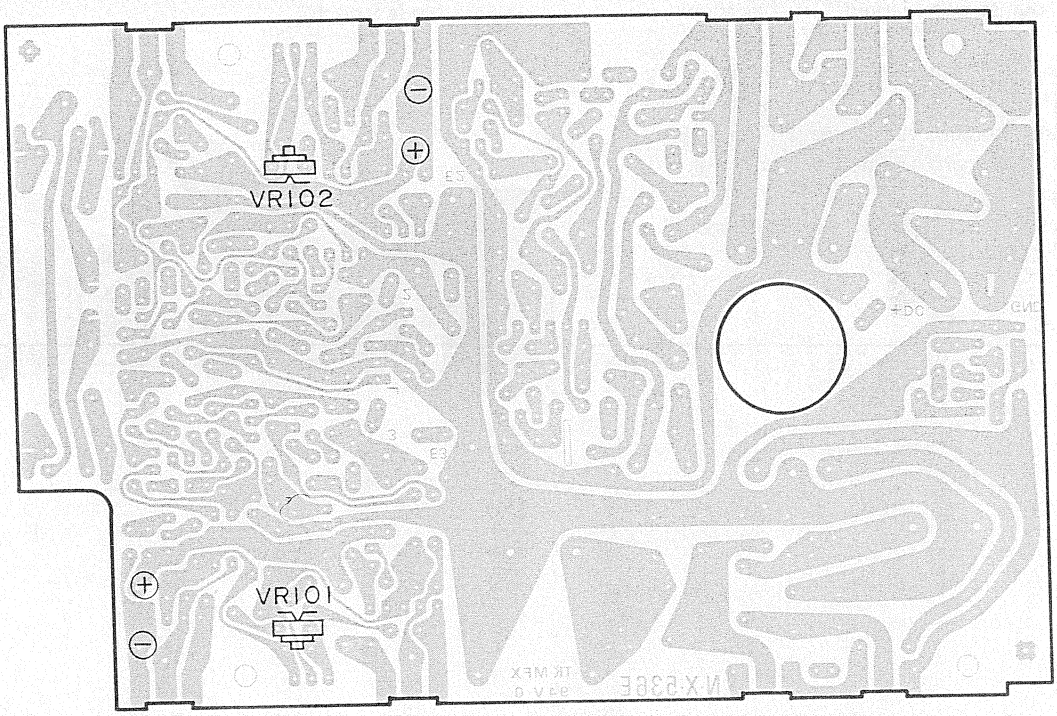
(2) Adjustment Procedures

Rotate the semi-fixed variable resistors VR101 and VR102 clockwise or counterclockwise to obtain 8.8mV ±2.2mV on the VTVM.

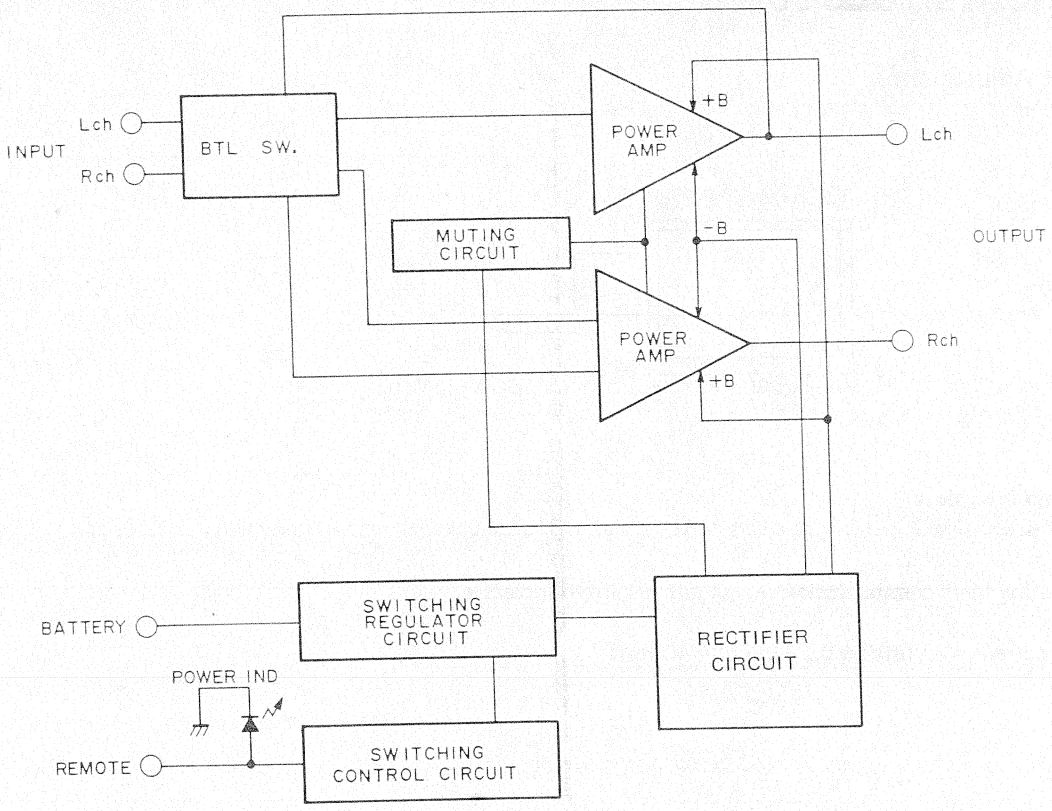
When rotating them counterclockwise, the idling current increases.

- Idle current = 8.8(mV) ÷ 0.22 (ohm) = 40(mA)

Adjustment Location

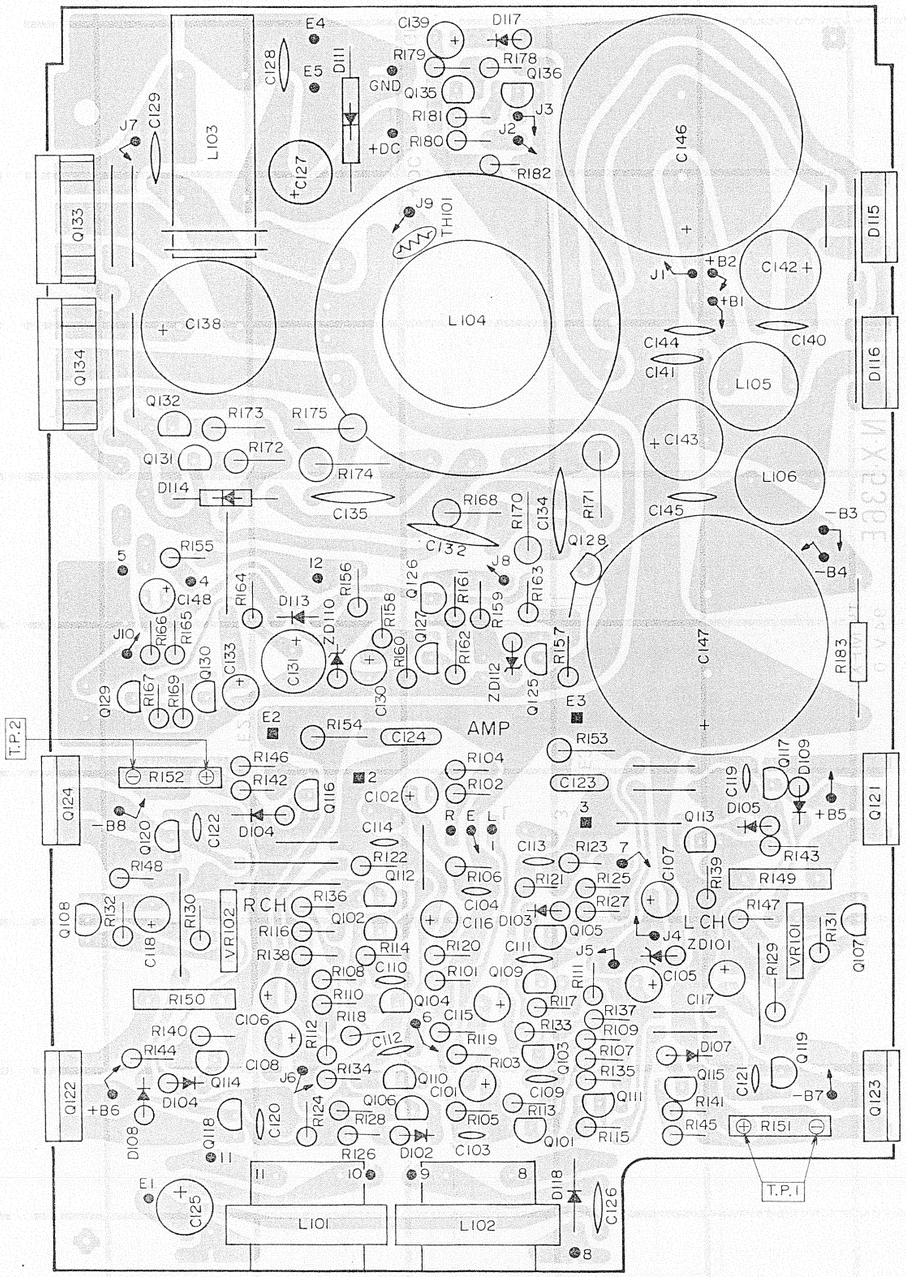


Block Diagram

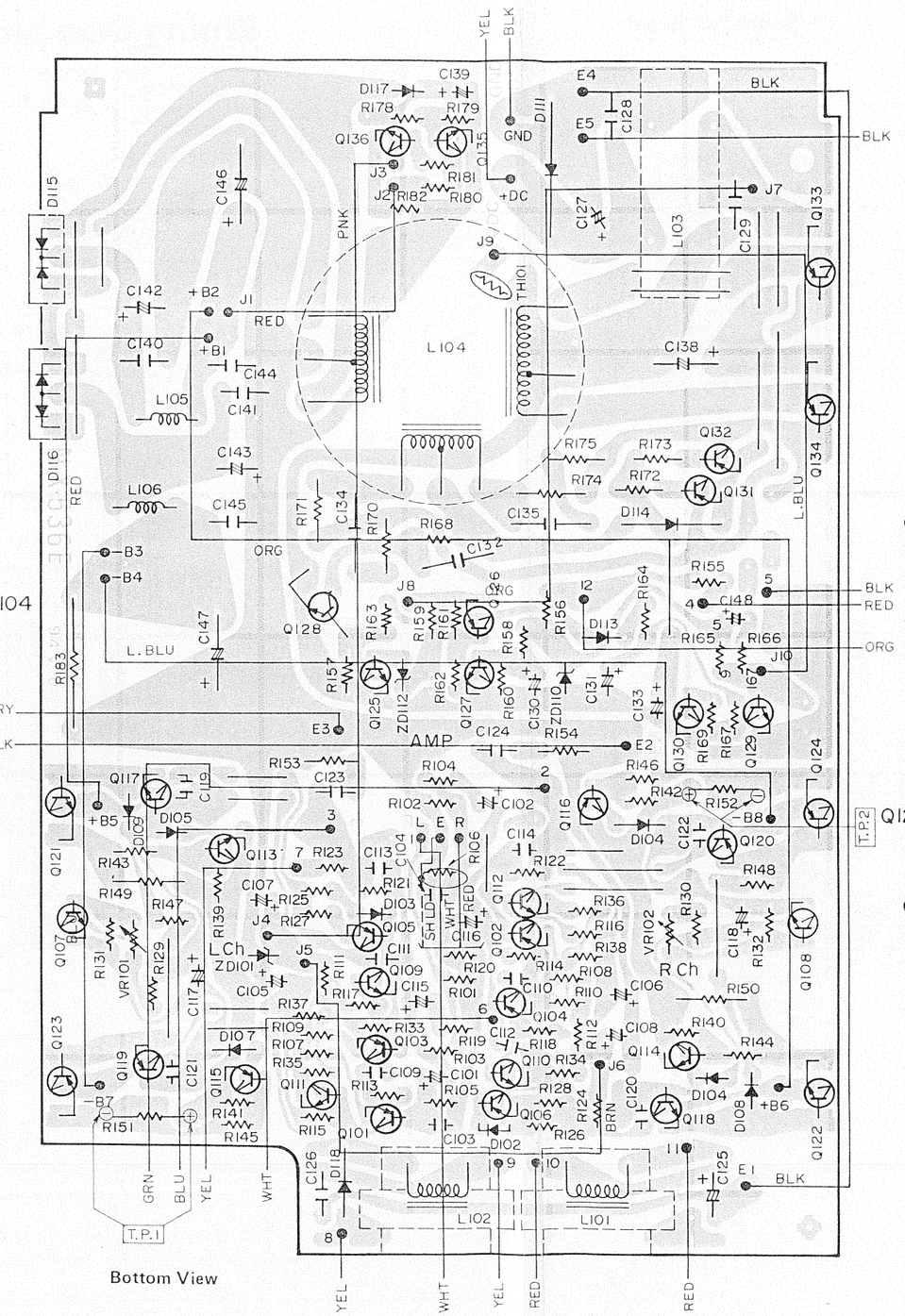


Parts Layout on P.C. Boards

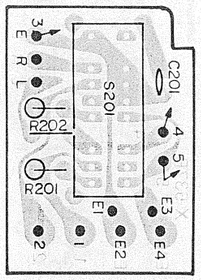
- Main P.C. Board



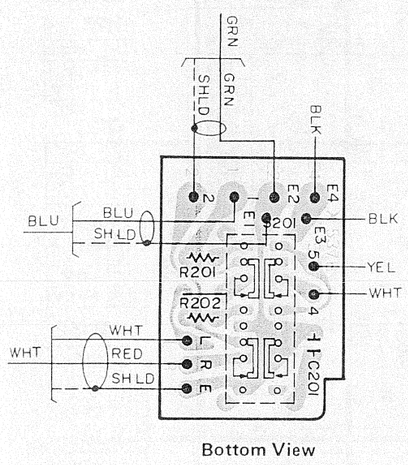
Top View


YEL
BLK
E4
D117
C139
R178
R179
BLK
Q136
Q135
GND
D111
E5
C128
J3
R181
J2
R182
R180
+DC
C127
L103
J7
C129
Q133
PNK
J9
THI01
D115
C146
C142
+B2
J1
RED
C140
+B1
C144
C138
L104
C141
L105
D116
C143
R175
R173
Q132
R174
R172
Q131
L106
C145
R171
C134
R170
C135
D114
L.BLU
Q134
ORG
R168
C132
-B3
-B4
R155
C148
J8
Q126
J12
R164
BLK
RED
ORG
R163
R159
R161
R158
R156
D113
R165
R166
J10
C147
L.BLU
R183
Q128
R157
Q125
ZD112
R162
Q127
R160
C130
ZD110
C131
C133
Q130
R169
R167
Q129
E3
C124
R154
E2
AMP
R153
R104
2
R146
R142
R152
-B8
Q124
T.P.2
Q120
Q116
C102
R102
D104
C122
C114
R122
R148
Q121
+B5
Q117
D109
C119
D105
C104
L E R
R106
C113
R123
7
3
Q113
R143
R149
R147
C107
R139
R125
R127
J4
R121
R136
R116
R138
R114
R108
C110
R120
C111
Q109
R111
R117
R137
C117
R110
R118
Q104
C115
R133
R109
C106
C112
R119
R103
R107
D107
R135
Q103
C108
J6
R134
Q110
C109
Q115
C121
Q119
-B7
R151
Q123
R140
R144
Q114
+B6
D104
D108
C101
R113
R141
R145
R124
R128
R105
Q106
C120
Q118
R126
D102
C103
Q101
R115
11
10
9
8
E1
C125
C126
D118
L101
L102
T.P.1
GRN
BLU
YEL
WHT
BRN
SH LD
WHT
RED
Ch
ZD101
C105
J5
R111
R117
R131
VR101
R129
R107
R135
R141
R145
R151
R139
R147
R143
R149
R148
R132
R130
C118

- Switch P.C. Board

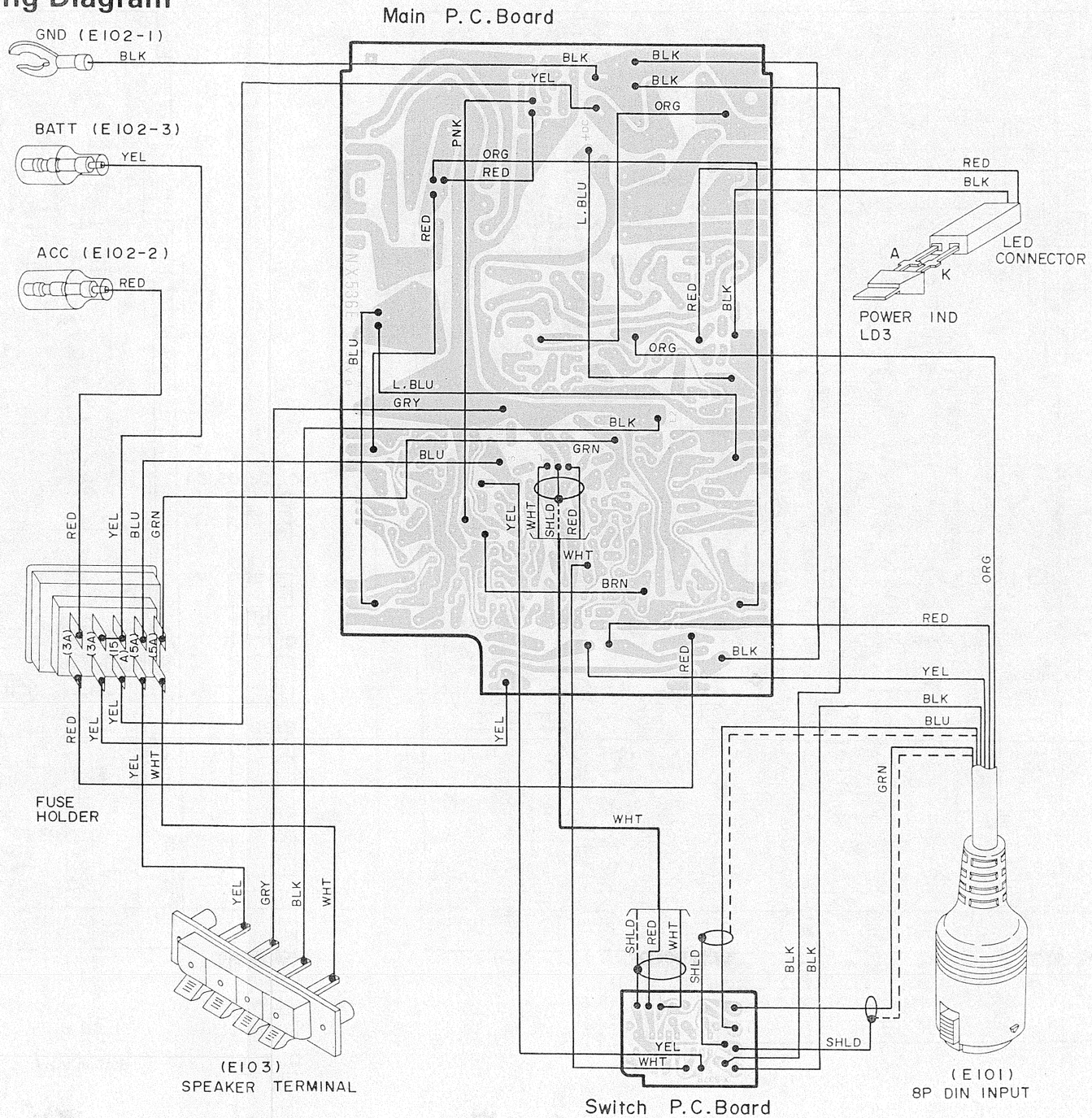


Top View

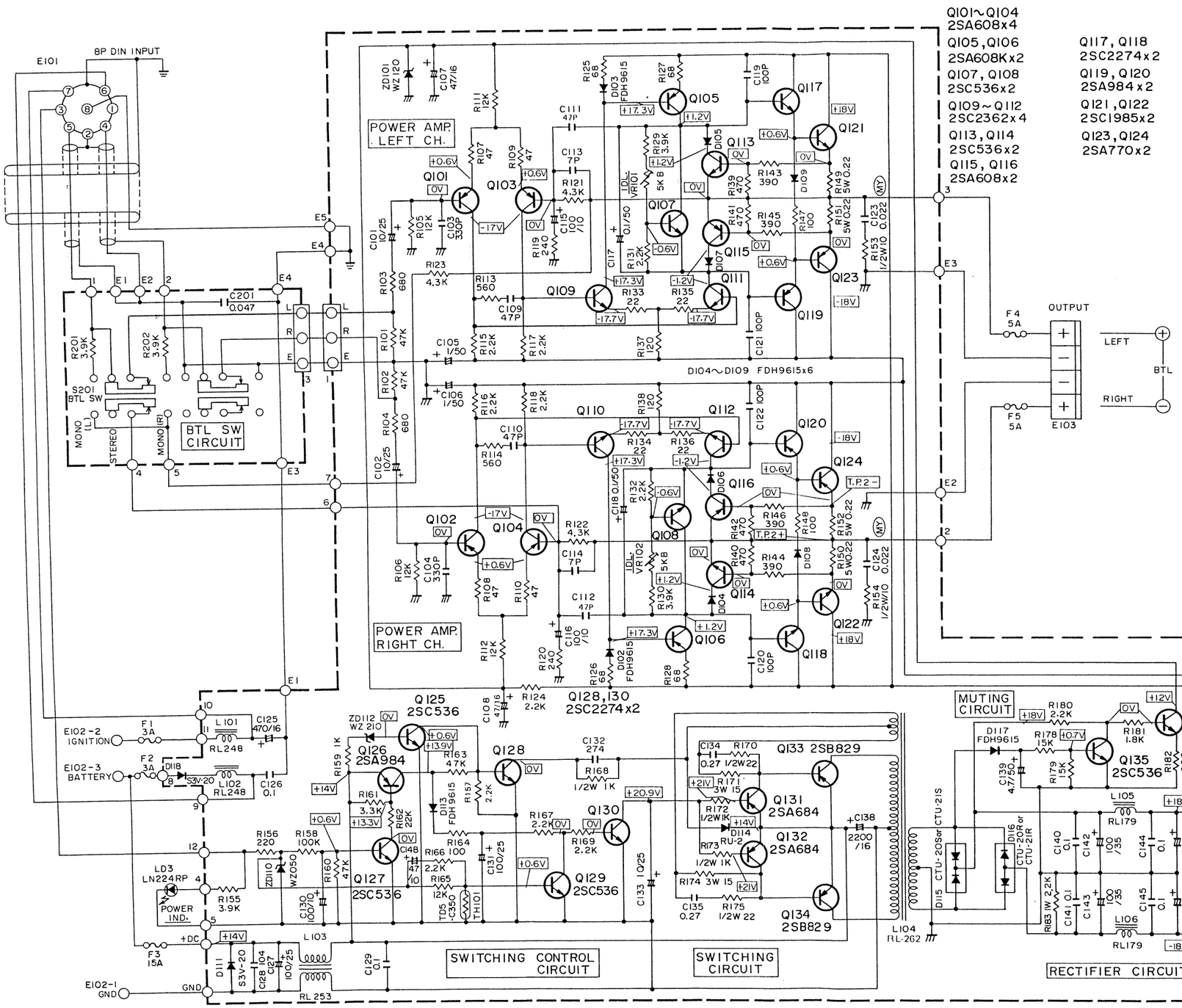


Bottom View

Wiring Diagram



Schematic Diagram



NOTES:

1. All resistance values are in ohms. K = 1,000
2. All capacitance values are in microfarads. P = $\frac{1}{1{,}000{,}000}$
3. Voltage reading with VTVM from the point shown to the chassis ground.

Electrical Parts List

Resistors (All resistors are carbon film, ¼W, ±5% unless otherwise noted.)
uF = microfarads, pF = picofarads

Symbol No.	Part No.	Description
Main P.C. Board		
Transistors		
Q101	48E00280S01	2SA608 (F)
or	48E00280S02	2SA608 (G)
Q102	48E00280S01	2SA608 (F)
or	48E00280S02	2SA608 (G)
Q103	48E00280S01	2SA608 (F)
or	48E00280S02	2SA608 (G)
Q104	48E00280S01	2SA608 (F)
or	48E00280S02	2SA608 (G)
Q105	48E00281S01	2SA608K (F)
or	48E00281S02	2SA680K (G)
Q106	48E00281S01	2SA680K (F)
or	48E00281S02	2SA680K (G)
Q107	48T47143F03	2SC536 (F)
or	47T47143F04	2SC536 (G)
Q108	48T47143F03	2SC536 (F)
or	48T47143F04	2SC536 (G)
Q109	48E00285S01	2SC2362 (F)
or	48E00285S02	2SC2362 (G)
Q110	48E00285S01	2SC2362 (F)
or	48E00285S02	2SC2362 (G)
Q111	48E00285S01	2SC2362 (F)
or	48E00285S02	2SC2362 (G)
Q112	48E00285S01	2SC2362 (F)
or	48E00285S02	2SC2362 (G)
Q113	48T47143F03	2SC536 (F)
or	48T47143F04	2SC536 (G)
Q114	48T47143F03	2SC536 (F)
or	48T47143F04	2SC536 (G)
Q115	48E00280S01	2SA608 (F)
or	48E00280S02	2SA608 (G)
Q116	48E00280S01	2SA608 (F)
or	48E00280S02	2SA608 (G)
Q117	48T47146F02	2SC2274 (E)
or	48T47146F03	2SC2274 (F)
Q118	48T47146F02	2SC2274 (E)
or	48T47146F03	2SC2274 (F)
Q119	48T47148F02	2SA984 (E)
or	48T47148F03	2SA984 (F)
Q120	48T47148F02	2SA984 (E)
or	48T47148F03	2SA984 (F)
Q121	48E00284S01	2SC1985 (O)
or	48E00284S02	2SC1985 (Y)
Q122	48E00284S01	2SC1985 (O)
or	48E00284S02	2SC1985 (Y)
Q123	48E00282S01	2SA770 (O)
or	48E00282S02	2SA770 (Y)
Q124	48E00282S01	2SA770 (O)
or	48E00282S02	2SA770 (Y)
Q125	48T47143F03	2SC536 (F)
or	48T47143F04	2SC536 (G)
Q126	48E00280S01	2SA608 (F)
or	48E00280S02	2SA608 (G)
or	48T47148F02	2SA984 (E)
or	48T47148F03	2SA984 (F)
Q127	48T47143F03	2SC536 (F)
or	48T47143F04	2SC536 (G)
Q128	48T47146F02	2SC2274 (E)
or	48T47146F03	2SC2274 (F)
Q129	48T47143F03	2SC536 (F)
or	48T47143F04	2SC536 (G)
Q130	48T47146F02	2SC2274 (E)
or	48T47146F03	2SC2274 (F)
Q131	48T52548F01	2SA684 (S)
or	48T52548F02	2SA684 (R)
Q132	48T52548F01	2SA684 (S)
or	48T52548F02	2SA684 (R)
Q133	48E00283S01	2SB829 (Q)
or	48E00283S02	2SB829 (R)
or	48E00283S03	2SB829 (S)
Q134	48E00283S01	2SB829 (Q)
or	48E00283S02	2SB829 (R)
or	48E00283S03	2SB829 (S)
Q135	48T47143F03	2SC536 (F)
or	48T47143F04	2SC536 (G)
Q136	48T47143F03	2SC536 (F)
or	48T47143F04	2SC536 (G)

Symbol No.	Part No.	Description
Diodes		
ZD101	48E00289S02	Zener, WZ120
or	48E00498S03	RD12EB
D102	48E00177S02	FDH9615
D103	48E00177S02	FDH9615
D104	48E00177S02	FDH9615
D105	48E00177S02	FDH9615
D106	48E00177S02	FDH9615
D107	48E00177S02	FDH9615
D108	48E00177S02	FDH9615
D109	48E00177S02	FDH9615
ZD110	48E00289S01	Zener, WZ050
or	48E00498S04	Zener, RD5.1EB
D111	48E00288S03	S3V-20
or	48E00497S01	DSA26B
ZD112	48E00289S03	Zener, WZ210
or	48E00498S01	RD22EB
D113	48E00177S02	FDH9615
D114	48E00288S04	RU-2
or	48E00497S02	DFC10E
D115	48E00288S01	Bridgeable, CTU-20S
or	48E00288S07	Bridgeable, CTU-21S
D116	48E00288S02	Bridgeable, CTU-20R
or	48E00288S08	Bridgeable, CTU-21R
D117	48E00177S02	FDH9615
D118	48E00288S03	S3V-20
or	48E00497S01	DSA26B
Coils		
L101	25E00287S01	RL248
L102	25E00287S01	RL248
L103	24E00202S04	RL253
L104	24E00286S01	RL262
L105	24E00202S03	RL179
L106	24E00202S03	RL179
Thermister		
TH101	48E00373S01	TD5-C350D

Symbol No.	Part No.	Description
Capacitors		
C101	23D44333G09	Electrolytic 10 uF/25V
C102	23D44333G09	Electrolytic 10 uF/25V
C103	21E00252S07	Ceramic 330 pF
C104	21E00252S07	Ceramic 330 pF
C105	23S41198U03	Electrolytic 1 uF/50V
C106	23S41198U03	Electrolytic 1 uF/50V
C107	23C44780P01	Electrolytic 47 uF/16V
C108	23C44780P01	Electrolytic 47 uF/16V
C109	21C45322G18	Ceramic 47 pF
C110	21C45322G18	Ceramic 47 pF
C111	21C45322G18	Ceramic 47 pF
C112	21C45322G18	Ceramic 47 pF
C113	21C45322G07	Ceramic 7 pF
C114	21C45322G07	Ceramic 7 pF
C115	23C44780P10	Electrolytic 100 uF/10V
C116	23C44780P10	Electrolytic 100 uF/10V
C117	23T43247F01	Electrolytic 0.1 uF/50V
C118	23T43247F01	Electrolytic 0.1 uF/50V
C119	21E00252S08	Ceramic 100 pF
C120	21E00252S08	Ceramic 100 pF
C121	21E00252S08	Ceramic 100 pF
C122	21E00252S08	Ceramic 100 pF
C123	08C44833J17	Mylar 0.022 uF
C124	08C44833J17	Mylar 0.022 uF
C125	23S41198U56	Electrolytic 470 uF/16V
C126	21E00205S01	Ceramic 0.1 uF
C127	23S41198U35	Electrolytic 100 uF/25V
C128	21E00205S01	Ceramic 0.1 uF
C129	21E00205S01	Ceramic 0.1 uF
C130	23C44780P10	Electrolytic 100 uF/10V
C131	23S41198U35	Electrolytic 100 uF/25V
C132	21E00205S08	Ceramic 0.27 uF
C133	23D44333G09	Electrolytic 10 uF/25V
C134	21E00205S08	Ceramic 0.27 uF
C135	21E00205S08	Ceramic 0.27 uF
C138	23E00312S01	Electrolytic 2200 uF/16V
C139	23S41198U09	Electrolytic 4.7 uF/50V
C140	21E00205S01	Ceramic 0.1 uF
C141	21E00205S01	Ceramic 0.1 uF
C142	23S41198U36	Electrolytic 100 uF/35V

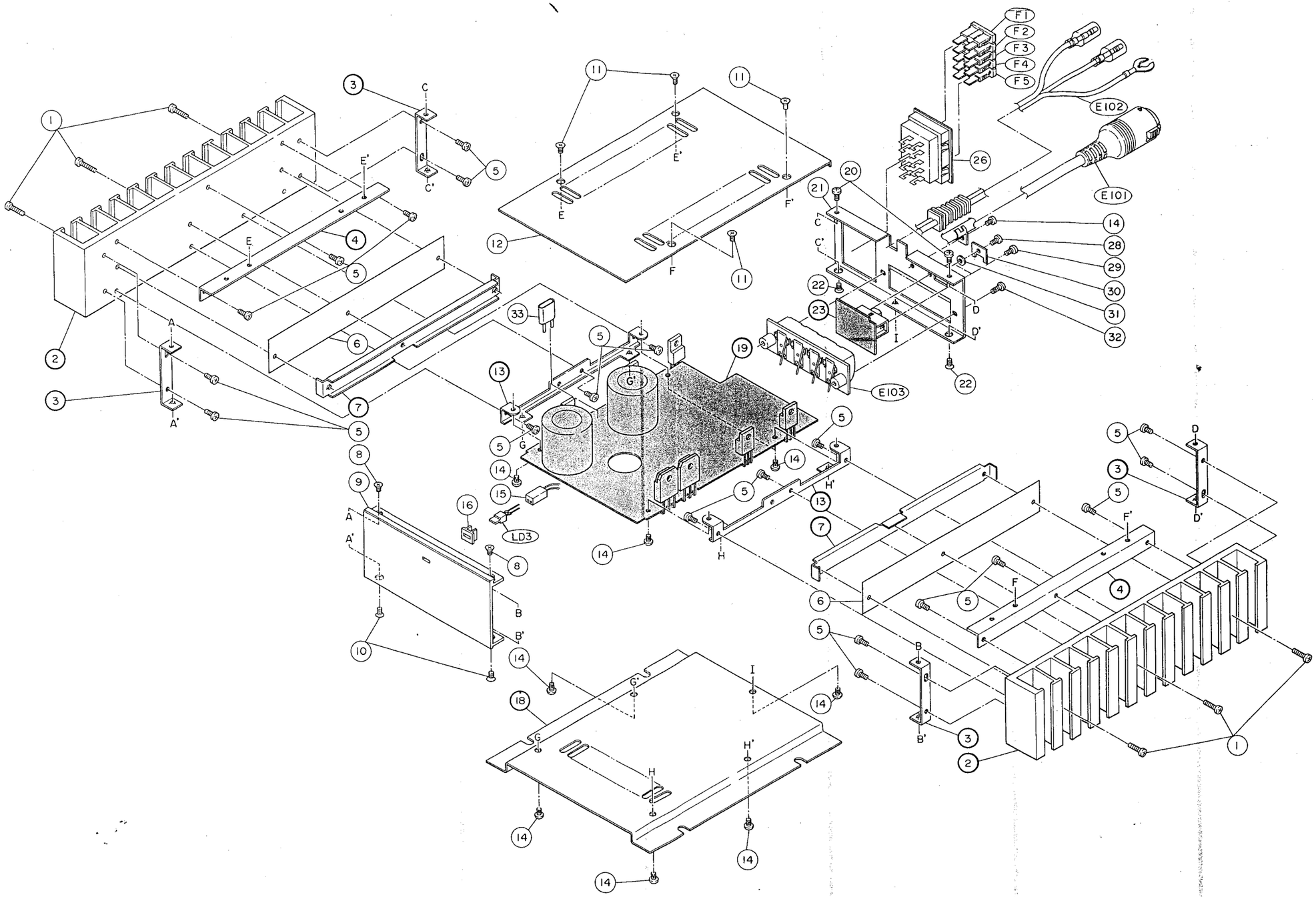
Symbol No.	Part No.	Description
C143	23S41198U36	Electrolytic 100 uF/35V
C144	21E00205S01	Ceramic 0.1 uF
C145	21E00205S01	Ceramic 0.1 uF
C146	23E00301S01	Electrolytic 3300 uF/35V
C147	23E00301S01	Electrolytic 3300 uF/35V
C148	23C44780P09	Electrolytic 47 uF/10V
Resistors		
R101	06S41801P52	47K ohm
R102	06S41801P52	47K ohm
R103	06S41801P30	680 ohm
R104	06S41801P30	680 ohm
R105	06S41801P45	12K ohm
R106	06S41801P45	12K ohm
R107	06S41801P16	47 ohm
R108	06S41801P16	47 ohm
R109	06S41801P16	47 ohm
R110	06S41801P16	47 ohm
R111	06S41801P45	12K ohm
R112	06S41801P45	12K ohm
R113	06S41801P29	560 ohm
R114	06S41801P29	560 ohm
R115	06S41801P36	2.2K ohm
R116	06S41801P36	2.2K ohm
R117	06S41801P36	2.2K ohm
R118	06S41801P36	2.2K ohm
R119	06S44593P50	240 ohm
R120	06S44593P50	240 ohm
R121	06S44593P80	4.3K ohm
R122	06S44593P80	4.3K ohm
R123	06S44593P80	4.3K ohm
R124	06S41801P36	2.2K ohm
R125	06S41801P18	68 ohm
R126	06S41801P18	68 ohm
R127	06S41801P18	68 ohm
R128	06S41801P18	68 ohm
R129	06S41801P39	3.9K ohm
R130	06S41801P39	3.9K ohm

Symbol No.	Part No.	Description
R131	06S41801P36	2.2K ohm
R132	06S41801P36	2.2K ohm
R133	06S41801P12	22 ohm
R134	06S41801P12	22 ohm
R135	06S41801P12	22 ohm
R136	06S41801P12	22 ohm
R137	06S41801P21	120 ohm
R138	06S41801P21	120 ohm
R139	06S41801P28	470 ohm
R140	06S41801P28	470 ohm
R141	06S41801P28	470 ohm
R142	06S41801P28	470 ohm
R143	06S41801P27	390 ohm
R144	06S41801P27	390 ohm
R145	06S41801P27	390 ohm
R146	06S41801P27	390 ohm
R147	06S41801P20	100 ohm
R148	06S41801P20	100 ohm
R149	06E00300S01	(Metal Plate) 0.22 ohm 5W
R150	06E00300S01	(Metal Plate) 0.22 ohm 5W
R151	06E00300S01	(Metal Plate) 0.22 ohm 5W
R152	06E00300S01	(Metal Plate) 0.22 ohm 5W
R153	06E00297S02	(Metal Film) 10 ohm 1/2W
R154	06S00297S02	(Metal Film) 10 ohm 1/2W
R155	06S41801P39	3.9K ohm
R156	06S41801P24	220 ohm
R157	06S41801P36	2.2K ohm
R158	06S41801P56	100K ohm
R159	06S41801P32	1K ohm
R160	06S41801P52	47K ohm
R161	06S41801P38	3.3K ohm
R162	06S41801P48	22K ohm
R163	06S41801P44	10K ohm
R164	06S41801P20	100 ohm
R165	06S41801P45	12K ohm
R166	06S41801P36	2.2K ohm
R167	06S41801P36	2.2K ohm
R168	06E00297S03	(Metal Film) 1K ohm 1/2W
R169	06S41801P36	2.2K ohm
R170	06E00297S01	(Metal Film) 2.2 ohm 1/2W
R171	06E00298S01	(Metal Film) 15 ohm 3W
R172	06E00297S03	(Metal Film) 1K ohm 1/2W
R173	06S00297S03	(Metal Film) 1K ohm 1/2W
R174	06E00298S01	(Metal Film) 15 ohm 3W
R175	06E00297S01	(Metal Film) 2.2 ohm 1/2W

Symbol No.	Part No.	Description
R178	06S41801P46	15K ohm
R179	06S41801P46	15K ohm
R180	06S41801P36	2.2K ohm
R181	06S41801P35	1.8K ohm
R182	06S41801P24	220 ohm
R183	06E00299S01	(Metal Film) 2.2K ohm 1W
VR101	18E00201S02	Variable 5K ohm (B)
VR102	18E00201S02	Variable 5K ohm (B)
Switch P.C. Board		
Capacitor		
C201	21E00205S09	Ceramic 0.047 uF
Resistor		
R201	06S41801P39	3.9K ohm
R202	06S41801P39	3.9K ohm
Switch		
S201	40E00211S02	Slide (SSA043)
Miscellaneous Parts		
E101	30E00192S05	Cord, 8 Pin Din
E102	30E00306S01	Ass'y, Lead Wire
E103	29E00303S01	Terminal, 4 Pin (Push)
LD3	48T44852F01	LED (LN224 RP)
F1	65T58596F01	Fuse, 3A
F2	65T58596F01	Fuse, 3A
F3	65T58596F05	Fuse, 15A
F4	65E00292S02	Fuse, 5A
F5	65E00292S02	Fuse, 5A

Symbol No.	Part No.	Description

Exploded View (Cabinet)



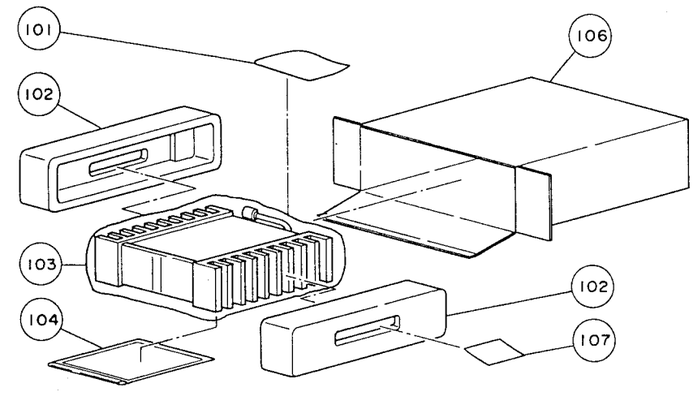
Cabinet Assembly Parts List

Index	Symbol No.	Part No.	Description
	1	03E00214S19	Screw, Bind (M3 x 14)
	2	※.	Heat Sink
	3	※	Bracket, Panel
	4	※	Bracket, Top Cover
	5	03S40011G17	Screw, Pan (M3 x 6)
	6	14E00305S01	Sheet, Insulation
	7	※	Bracket, Transistor
	8	03E00214S16	Screw, Countersink (M3 x 6)
3-C	9	13E00290S01	Panel, Front
4-C	10	03S40012G01	Screw Tapping (M3 x 5)
	11	03E00214S17	Screw, Tapping (M3 x 6)
2-D	12	15E00291S01	Cover, Top
	13	※	Bracket, Bottom Cover
	14	03E00214S18	Screw, Tapping (M3 x 6)
3-D	15	30E00199S02	Connector, LED
3-D	16	15E00308S01	Holder, LED
4-D	18	※	Cover, Bottom
3-E	19	※	Ass'y, Main P.C. Board
2-F	20	03E00214S02	Screw, Tapping (Z) (M3 x 6)
2-E	21	27E00302S01	Panel, Rear
	22	03E00214S20	Screw, Countersink(Z)(M3×4)
2-E	23	※	Ass'y, Switch P.C. Board
2-F	26	15E00304S01	Holder, Fuse
2-G	28	03E00108S20	Screw, Pan (M2.6 x 6)
2-G	29	03E00108S19	Screw, Bind (N) (M2.6 x 4)
2-G	30	07E00307S01	Support, Switch
2-G	31	04E00062S04	Washer, Nylon
2-G	32	03E00214S21	Screw, Tapping (M3 x 10)
2-D	33	43E00610S01	Bush, Cap

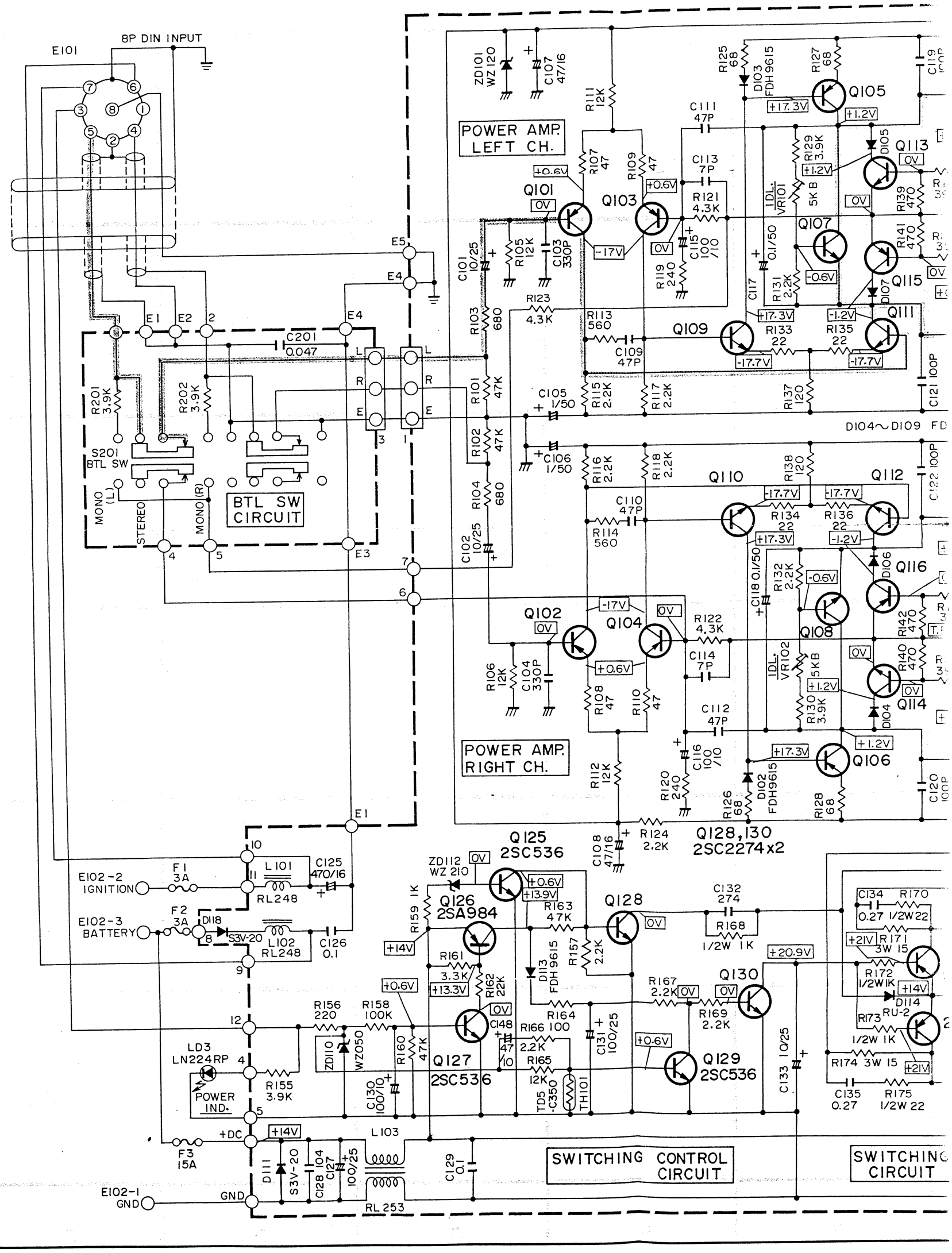
Index	Symbol No.	Part No.	Description

NOTE: ※ The parts without part numbers are not supplied.

Packing Method View



Transistor (Q)	Q101 Q103 Q109 Q105,107,113,115,111, Q102 Q104 Q110 Q106,108,114,116,112, Q126,127,125 Q128 Q129 Q130 Q131,
Diode (D)	D118 D101 D103 D105,107 D102 D104,106 D003 D111 D110 D112 D113



| | | |

Packing Assembly Parts List

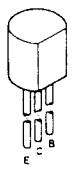
Symbol No.	Part No.	Description
101	01E00311S01	Assembly, Installation Kit (A)
101-1	03E00213S06	Screw, Tapping (B) (M4 x 12)
101-2	65E00292S02	Fuse, 5A
101-3	65T58596F01	Fuse, 3A
101-4	65T58596F05	Fuse, 15A
102	56E00295S01	Tray, Packing
103	56E00216S06	Sack, Polyethylene
104	68P60806F75	Owner's Manual
106	56E00294S01	Carton, Packing (Individual)
107	01V00100S54	Assembly, Speaker Cord
107-1	30E00378S03	Speaker Cord Green (White/Yellow)
107-2	30E00378S04	Speaker Cord Gray (White/Yellow)
108	※	Carton, Packing (Master)

Symbol No.	Part No.	Description
	Labels	
	54E00296S01	ID (Bottom Cover) Serial No.

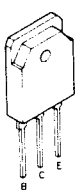
NOTE: ※ The parts without part numbers are not supplied.

Semi-Conductor Lead Identifications

2SA608: Q101, 102, 103, 104
Q115, 116, 126
2SA608K: Q105, 106
2SC536: Q107, 108, 113, 114
Q125, 127, 128, 129
Q130, 135, 136
2SC2362: Q109, 110, 111, 112
2SC2274: Q117, 118
2SA984: Q119, 120
2SA684: Q131, 132



2SB829: Q133, 134



2SA770: Q123, 124
2SC1985: Q121, 122